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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,321	11/26/2003	David G. Shaw	56770US035	9479

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EXAMINER	
PADGETT, MARIANNE L	
ART UNIT	**PAPER NUMBER**
1762	

DATE MAILED: 06/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/723,321	SHAW ET AL.	
	Examiner	Art Unit	
	Marianne L. Padgett	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *1-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/17/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-9, drawn to a barren sheet comprising a thermoplastic substrate, with a smoothing layer and then an oxygen barrier layer thereon, classified in class 428, subclass 426 or 446 or (?500$^+$) or 688$^+$ or 702.

II. Claims 10-20, drawn to a method of making a barrier sheet by applying smoothing to a thermoplastic substrate, then a barrier layer to the smoothing layer, classified in class 427 or 204, subclass (296 or 561 or 569$^+$) or (192.15or 192.22 or 192.23).

2. The inventions are distinct, each from the other because:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by different processes, such as co-extrusion of the two polymeric layers (substrate sheet and smoothing layer) followed by deposition of the oxygen barrier layer; or even co-extrusion of all 3 layers, given that for the broadest claim only specifies that the material type of the substrate is thermoplastic, and it is possible for a polymeric material to have oxygen barrier properties of some degree.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II or visa versa, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with David Cleveland (29524) on April 7, 2005 a provisional election was made without traverse to prosecute the invention of Group II method, claims 10-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

6. Claims 10-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble of claim 10 requires making of a "barrier sheet", however the substrate in the body of the claim is of no particular shape, hence the preamble and body are not commensurate in scope.

Use of relative terms in the claims that lack clear metes and bounds in the claim or in the specification or in cited relevant prior art, is vague and indefinite. In independent claim 10, line 3, "transparent" to what? The claims provide no relevant information, and while a reader may assume that visually transparent is intended, assumptions do not necessitate meanings. Review of the specification found "transparent" used on pages 21 and 23 in "transparent [oxygen] barrier", however in neither case was a definition or clear metes and bounds provided, but lines 13-22 of page 21 did provide examples that

required an acrylate monomer layer formed, then cross-linked on the substrate, which layer was then coated with SiO_x (later referred to as silicon oxide) or Al oxide. Also note the subscript x is undefined, and that examples do not constitute definitions. Hence, the scope of "transparent barrier film" in the claims is unclear.

In line 4 of claim 10 "smoothing" in "smoothing layer" is a relative description of an effect, but since there is no necessary roughness or any surface on the substrate that necessarily needs any smoothing, the scope of this effect and what is included by "smoothing layer" is uncertain. A review of the specification found no use of this phrase therein, hence read in light of the specification the scope is unknown. It was noted that on page 5, line 28-page 6, line 3, it was disclosed that the thickness of the acrylate layer was desired to be sufficient for smoothing roughness of underlying substrate, where the adequate smoothing was needed for vacuum metallizing (not the transparent barrier films). On page 22, lines 25-29+ substantial improvement of O-permeability was attributed to forming a liquid film of polyfunctional acrylate by condensing from vapor phase to assure smooth and uniform coating, forming an excellent surface for metallization. Neither of these provides necessary definition nor scope for the "smoothing layer" of the claims. It is noted that all discussion in the specification concerning durability or importance of the smoothness of the acrylate layer was associated with the metallization teachings, not the transparent barriers (Si or Al oxides) and is analogous to the teachings of Revell (5,021,298) concerning the criticality of the smoothness of the plastic coating for achieving desired barrier properties upon metallization. Note extending the same criticality to the oxide coatings would have the same degree of obviousness in either case.

In claim 14, "protective" describing "protective layer" is also a relative term. Protection from what? Is it a particular environment or action or something else? The scope of what is included by protective layer is unclear, and examples of acrylate layers given in the specification are not definitions,

especially as the term was not found used in association with "transparent barrier film" with which it is claimed.

7. The disclosure is objected to because of the following informalities: The continuing data on page 1 of the specification needs to be updated to reflect the current status of parent case 08/741,609 as abandon.

Appropriate correction is required.

8. On page 21, as noted above, x in SiO_x is undefined which the examiner assumes means it is non-stoichiometric or with the later used silicon oxide, generally includes any oxides of Si.

9. Claims 10-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Given that this case is a continuation of parent case 08/741,609, and the claims submitted with the present application are different than the original claims of the parent, they are not part of the original specification.

As found in reviewing the specification for meaning as discussed in Section 5 above, "smoothing layer" was not used or claimed in the original specification, hence is considered to include New Matter. The term while not having a defined scope, can logically be considered to include any film capable of providing a smoother layer, but the only contemplated layer found in the original specification is a layer of acrylate monomer deposited and cross-linked, either with the transparent [oxide] barrier film, or with the more thoroughly discussed metalized layer.

While there is generic (undefined) disclosure of "transparent barrier film", the only disclosure of sputtering or plasma enhanced CVD are specific to the taught Si oxide or A1 oxide, with the sputtering

being specific to sputtering of aluminum or silicon in an oxygen plasma, hence these deposition processes claimed for the present breath of "transparent barrier film" include New Matter also.

On page 21, lines 23 - 24 provide support for a second acrylate layer deposited on the [Si or Al] oxide barrier layer disclosed in the paragraph preceding it, and while the rest of that paragraph (lines 25-29) is devoted to metal barrier layers, the line 28 statement "oxygen barriers are further enhanced by multiple layers, such as..." could be considered to include the specific transparent oxide barriers of lines 13-22, due to the paragraphs introductory sentence, hence claim 13's recitation of 3 or more layers will not be considered to introduce more New Matter.

In claim 14, the use of a generic "protective layer" on the transparent barrier film of claim 10, also is inclusive of New Matter, since it is broader than the scope of the only disclosed layer (acrylate) that was taught as deposited on the oxygen barrier material, as also discussed in section 6 above.

10. Claims 10-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As discussed above, "transparent barrier film", "smoothing layer", "protective layer", sputtering and PECVD, lack enablement for their present scope in the claims.

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 10-12, 14-16 and 19 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-11 and 13 of U.S. Patent No. 5,725,909. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of the patent are generally narrower than those of the present claims, with encompassed overlapping limitations, with the transparent barrier layer of the present claims encompassing the silicon oxide or A1 oxide limitations of the patent, as these materials are the only ones

described in the present case as reading on the transparent barrier material, with this case disclosing like deposition techniques, hence in light of the specification the specific oxides of the patent (909) are considered encompassed by the transparent barrier of this application.

The present claims' "smoothing layer", is further defined in dependent claims as formed from an acrylate monomer that is generic to those claimed in the patent, with the flash evaporation of present claim 12 overlapping with evaporation techniques of the patent. While flash evaporation may be considered more specific than the generic evaporation f the claims, it is an old and well-known technique for vaporizing polymeric or prepolymer materials, hence would have been an obvious option to one of ordinary skill in the art, as a typical means for achieving claimed evaporation.

Some of the patent claims, such as 8 or 11 discuss performing the evaporation process in vacuum, but do not say whether or not the secondary barrier deposition is also in vacuum, which differs from claim 16, which has all "the forming step" carried out in vacuum, however as deposition of oxides of Al or Si may conventionally be vacuum deposition processes, it would have been obvious for one of ordinary skill in the art to use such typical processing procedures, especially given the preceding use of vacuum for the acrylate layer would make continuing a like deposition environment more efficient & provide less opportunities to introduce contaminates.

The patent claims do not claim that their thermoplastic substrates are necessarily sheets or on rolls, however neither dose the body of applicants' independent claim, and it is old and well known that a typical plastic material requiring barrier layers is sheet materials used for wrapping or packaging (such as for food), and depending on thickness it may be conventionally stored in bulk on rolls, hence it would have been obvious to one of ordinary skill in the art to be employing the process of the patent on such material old and well known to require barrier coatings for optimum effectiveness.

13. Claims 10 and 16-18 are rejected under 35 U.S.C. 102(b) or (e) as being anticipated by Williams et al (5,364,666).

Given all the New Matter in the claims that was effectively added on the filing date (11/26/03) of this case, the 102(b) would appear to be the most appropriate, unless support apparently missing from the specification can be shown to be present in the preceding cases, such as the related CIP's.

In Williams ('666), a sequence of Si oxide based films are deposited to form a gas and water barrier film that may be transparent, where the substrate is a plastic, exemplified by PET (a thermo-plastic), which may be shaped as packaging or containers, etc. The preferred deposition process is PECVD for the barrier materials, but other deposition techniques, such as sputtering are also taught as useful. Williams teaches that their first Si oxide deposit will inherently effect surface morphology, where the first set of steps removed and/or redistribution foreign surface particles, hence this first layer may be considered to read on applicant's board, and essentially undefined "smoothing layer", because it effects a type of smoothing on the substrate surface enabling complete coverage with improved permeability properties after the second layer. The second layer of Si oxide then deposited reads on the claimed oxygen barrier material. See the abstract; col. 1, lines 5-10 & 42-68; Summary, especially col. 2, lines 6-27 & 33-43; col. 3, lines 15-25+ & 44-55; col. 4, lines 8-43+; col. 6, lines 42-51; and Table on col. 7.

14. Claims 10-11, (12) and 13-19 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Affinito (6,497,598 B2).

It is noted that while the patent providing Affinito's effective filming date is December 16, 1998, which is after applicant's parents filing date, the New Matter discussed, above, was in the claims filed November 26, 2003, hence November 26, 2003 may be considered to be the effective date for the claims as presently written. Claim 12, might arguably be considered supported in the parent and in the grand parent (col. 6, lines 56-62 and col.17, lines 28-59 in PN5,440,446), because a smoothing effect for the particular vapor deposited cross-linked acrylate monomers coating are discussed in same circumstances, but they are not clearly associated with the claimed transparent barrier film, so claim 12 is listed above in parenthesis.

In Affinito, see the abstract; Figures 1 & 2; col. 1, line 35- col. 2, lines 13 & 33-59, especially 52-59; col. 3, line 11- col. 4, line 45, especially col. 3, line 52-60 and col. 4, lines 24-45 for vacuum deposition, including flash evaporation of monomers for first (smoothing) and succeeding polymer layers, and sputtering or PECVD of the ceramic barrier layer, and col. 4, lines 3-8 for substrates that include thermoplastics like PET; col. 4, line 9-11 that include acrylic or methacrylic polymer layers, noting that the taught monomers therefore are inclusive of acrylates, and col. 4, lines 12-23 which list various preferred transparent ceramics. Note Figure 2, illustrates the multilayer configuration that corresponds to claim 13, which is also, structurally described in patent claims 1-2, 4-5, 8, 10-12 and 14-16.

15. Other art equivalent to Affinito for some or all the above rejected claims includes Graff et al (6,492,026 B1 or 6,413,645 B1), or Bright (2003/0124392 A1), or Mikhael et al (6,468,595 B1), or Yializis (6,214,422 B1), or Tropsha et al (65,545,375), all of which are only prior art with respect to the New Matter introduced in the claims submitted with this continuation.

16. Claims 10-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yializis et al (4,842,893) or Shaw et al (5,032,461) in view of Komiya (EP 0,475,441 A2).

The primary references teach flash evaporating and curing monomers of acrylates on substrates that may be flexible plastics, like polyesters, which are thermoplastics, and where the coatings may be used for packaging materials. An inorganic or metal layer may be vacuum (evaporation or sputter) deposited thereon, followed by another vapor deposited acrylate monomer layer, which is cross-linked. Additional interlevel layers may also be deposited. Continuous substrates and rotating drum supports are illustrated and discussed. In Yializis et al (893), see the abstract; Figures 1-3, 4d & 5; col. 1, lines 12-22 & 43-48 (for food packaging or protective coatings, etc); col. 2, lines 28-50+; col. 3, lines line 8 (flush evaporated), 20-25 (curing), and 26-65 (substrates, e.g. polyester or polyolefins, flexible, packaging); col. 4, 23- col. 5, line 30+, esp. col. 4, lines 26-28 for vacuum system and moveable support, line 35 for continuous moving surface, lines 48-49 for smooth surface and sheet or flexible material substrate, lines

56-66 for metal or inorganic material deposited by evaporation or sputtering, line 68 for flash evaporation and col. 5, lines 20-30 for acrylate monomers; col. 6, lines 24-33+ for flash evaporation, etc., of monomers; col. 7, lines 5-15 for curing. In Shaw et al (461), see the abstract; figures 2 & 4; col. 1, lines 15-18; col. 2, lines 14-12; Summary; esp. col. 3, lines 26-40+, col. 4, lines 7-9 & 23-31; col. 6, lines 23+ (acrylate monomers); col. 10, lines 10-43; col. 11, lines 26-50 (rotatable drum, inorganic or metal material deposited); col. 12, lines 50-64; col. 13, lines 1-10 and 51-61 (metal or other inorganic material by evaporation of sputtering onto cross-linked monomer), etc; and claims 3-5, 8-9, 15, 17-19, 22-24 & 36.

Yializis et al ('893) or Shaw et al ('461), both differ from the claims by not disclosing that their inorganic material deposited between layers of flash vapor deposited and cross-lined acrylate is a transparent oxygen barrier film or that the acrylate layer is a smoothing layer. The primary patent references deposit the acrylate monomer in the same manner as taught by the present application, hence while the layer is not called a "smoothing" layer, it must inherently have the same effect when deposited on analogous plastic substrates, that may be thermoplastics as claimed.

While barrier layers are not explicitly discussed, coatings for packaging materials and interlevel multilayers, such as substrate/acrylate/inorganic material/acrylate with possible repeated sequences are suggestive of barriers coatings, especially in view of Komiya who teaches the known usefulness of inorganic compounds, such as Si oxide as transparent gas barrier material in packaging materials (page 2, lines 10-25), and further teaches that such gas barriers may be improved by a polymeric overcoat (page. 3, Summary). Komiya provides specific examples of plastic substrates (polyester, polypropylene, PET, etc., page 3, lines 36-41), and of oxides or nitrogen, etc., such as Si_xO_y, $A1_2O_3$, Si_3N_4, where those that are transparent are particularly preferred, and deposition processes include sputtering, CVD, plasma deposition, etc. Therefore, it would have been obvious to one of ordinary skill in the art, given Komiya's teachings of the usefulness of those inorganic materials and their deposition techniques in preparing packaging materials, to employ them in the process of Yializis et al ('893) or Shaw et al ('461), for their

taught packaging substrates and generic inorganic interlevel layer, for their known gas barrier properties, and expected effectiveness, especially given overlapping deposition techniques for specific desirable species of the primary references generic teachings.

Note while there is no explicit teaching in the primary reference of a thermoplastic substrate being a roll of sheet material, one of ordinary skill in the art would have recognized that the normal bulk substrate supply made for sheet material to a rotating drum coating apparatus is via a roll, as the most practical and efficient storage/supply means therefore, hence making use of a roll obvious.

17. Other art equivalent to Komiya is Misiano et al (5,571,574) for claims 10-17 and 19, or JP 58-128,852 for claims 10-16 and 19.

18. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over (Yializis et al ('893) or Shaw et al ('461), in view of Komiya (EP)), or over Affinito as applied to claims 10-19 above, and further in view of Fujii et al (4,468,412) or Kim et al (5,403,626), especially in view of Pitt et al (5,108,780).

The main difference between these claims is the use of a reactive plasma to pre-treat the substrate in vacuum before vapor depositing the acrylic monomer thereon. However, pretreatment of hydrophobic plastic substrates before deposition of a polymeric coating is a standard technique used to improve adhesion of the coating material by activating the surface, as by forming functional groups to which the coating may bond, hence as such the plasma pretreatment technique would have been expected to improve adhesion on such polymeric substrates and would have been obvious to apply the process steps of Yializis et al ('893) or Shaw et al ('461) or Affinito.

Fujii et al is an example of such a pretreatment technique (abstract), teaching treating a polyolefin substrate that is inclusive of polyethylene, polypropylene, etc. (col. 2, lines 15-20), which may be pretreated by low temperature plasma applied at pressures lower that 10 mm Hg (i.e. vacuum) from a glow discharge or high frequency source or corona discharge techniques, which are all various types of

plasmas (col. 1, lines 30-41; col. 2, lines 20-25 & 44-68; and col. 4, lines 32-40) to provide wetting tensions of 38 to 65 dyne/cm^2 and where the coating material is inclusive of radiation curable and cross-linked acrylic monomers as claimed (col. 4, lines 47-64), hence Fujii et al shows the equivalent usage of corona and reactive plasma pretreatment, as well as the obviousness as discussed above and is applied in analogous situations. Note that as the process steps of the primary references are done in vacuum and the plasma pretreatment of Fujii et al is in vacuum, one of ordinary skill in the art would have done the entire sequence under those conditions as the requirements of the process fairly suggest such as a matter of practicality, since it would make no sense to be in vacuum, let up to air, then pump back down to vacuum, which is known to provide possible contamination source and is wasteful.

Kim et al is another example of such pretreatments, teaching use with thermoplastic substrates, such as polyethylene, etc. (col. 3, lines 18-23), for coating materials that include acrylate as cross-linking agents (col. 3, lines 35-42), where the substrate is pretreated to create activity points on the surface by a high frequency (HF) discharge to give a surface tension of 36 to 60 dynes/cm^2 (col. 3, lines 62-col. 4, line 17). The examiner notes that the applied HF discharge of Kim et al is inclusive of both low pressure (vacuum) and atmospheric plasma, with the corona discharge type being noted to be preferred for Kim et al's usage, which involves coating in air. Kim et al again shows the obviousness as discussed above and is applied in analogous situations.

Pitt et al teach enhancement of adhesion between a flexible substrate (fiber), that may be various materials (including organic polymeric fibers-claim 12), and a thermoplastic coating material which is deposited in a fluid state on the substrate, then solidified, where the substrate was "immediately" pretreated with plasma before the coating and where both plasma discharge and thermoplastic application are done under a continuous vacuum (Abstract; Figures 1 & 2; col. 1, lines 7-35+; col. 4, lines 31-51; col. 5, line 20-col. 7, line 24, etc.).

A potential difference between the pretreatment processes of applicant's claims and Pitt et al is the shape of the substrate, fiber verses sheet (preamble, not body of claim, except 19). The particular illustrated technique of applying liquid plastic, passes the substrate through the melted plastic instead of vapor coating is also a difference in how thermoplastic coatings are being applied to the pretreated substrate. In the parent case, it was noted that the coating materials of Pitt et al are thermoplastic, however such a category includes a broad range of polymers, including acrylic resins, hence the reference was found to be analogous subject matter. Shape of a continuous substrate is not a patentably significant difference, because composites or multilayer products are conventionally made in either form, especially as both film and fiber are discussed (col. 3, lines 62-65). Pitt et al also teach that any "conventional molding procedures applied in the formation of thermoplastic reinforced composites" may be used with his vacuum plasma pretreated method, showing that alternate coating procedures would have been expected to be effective, not just the melting procedure exemplified. One of ordinary skill in the art would recognize that the effect of the pretreatment is most relevant to its chemical effect on the bonds between polymeric substrate and coatings, not the phase of the coating material to be deposited, especially considering that after the vaporized monomer is condensed on the substrate, it too is liquid.

Pitt et al therefore provides further motivation as to why it would have been obvious for processes of plasma pretreating when used in conjunction with the vacuum deposition process of Yializis et al or Shaw et al or Affinito would have been done without letting up to air, i.e. in vacuum, as they show adhesive advantages (col. 5, lines 20-25 and col. 6, lines 55-63) are known for such a procedure, further showing the obviousness of continuous vacuum, since the formation of covalent bonds with the coatings, and prevention of reaction with unwanted substances prior to coating are consistent with, and desirable in the above combination.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marianne L. Padgett whose telephone number is (571) 272-1425. The examiner can normally be reached on Monday-Friday from about 8:30 a.m. to 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached at (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M.L. Padgett/dh
May 26, 2005

June 1, 2005

MARIANNE PADGETT
PRIMARY EXAMINER